Drinking Water Source Assessment

Water System

YOSEMITE NPS-YOSEMITE VALLEY

Mariposa County

Water Source

WELL 01

Assessment Date

July, 1998

California Department of Health Services
Drinking Water Field Operations Branch
DHS Merced District

District No.	**11**
System No.	**2210503**
Source No.	**001**
PS Code	**02S/22E-20M01 M**

Assessment Summary

District Name DHS Merced District **District No.** 11 **County** Mariposa

System Name YOSEMITE NPS-YOSEMITE VALLEY **System No.** 2210503

Source Name WELL 01 **Source No.** 001 **PS Code** 02S/22E-20M01 M

Completed by Leah Walker **Date** July, 1998

Description of System and Source

Description of the Park

Yosemite National Park is located in central California on the western slope of the Sierra Nevada. The park encompasses 1,169 square miles of which 1,101 square miles is undeveloped wilderness. The park receives approximately 4 million visitors each year. The number of employees in the park, for both the National Park Service and Yosemite Concession Services (YCS), vary from 1,500 in the winter to 2,900 in the summer. There are 15 campgrounds located in the park with 1,800 camp sites. YCS has 1,800 overnight accommodations, including motel rooms and cabins.

There are 21 water systems in the park, of which four are community water systems (Yosemite Valley, Wawona, El Portal, and Hodgdon Meadow). The other water systems are classified as transient-noncommunity and ten of these are seasonal operations. The water systems are served by a mix of ground water and surface water sources.

Description of the Water System

The Yosemite Valley water system is a community water system that serves the Yosemite Valley area of Yosemite National Park. This water system provides service to a permanent population of 2500 persons, 825 campsites, and approximately 3.2 million visitors each year through 235 service connections.

The water system consists of three wells, sodium hypochlorite disinfection facilities, and an above ground concrete storage tank with a capacity of 2.5 million gallons. The maximum day demand in 1997 occurred in June with a usage of 1.56 MG. The average day demand during June 1997 was 0.82 MGD. The combined production capacity of the three wells is approximately 3.9 MGD (2700 gpm).

Description of the Water Source

The water supply is provided by three wells drilled in unconsolidated, open pore formations. Continuous chlorination of the wells is provided at each well site. Each well is located within a watertight building with hatched doors to mitigate any flooding problems. However, in 1997 the water levels from the flood reached levels where the exhaust intakes were inundated with water, which flooded each well house.

Well No. 1 was constructed in 1972 to a depth of 1,015 feet. The well is equipped with a water lubricated 125-hp pump that produces 850 gpm. The intake of the pump is located at 144 feet. The well was constructed with a sanitary seal that is 420 feet deep.

Assessment Procedures

The assessment of the Yosemite Valley sources was conducted by DHS, the National Park Service, and US EPA. The following sources of information were used in the assessment:

Water system files
DHS files
Previous studies

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Procedures used to conduct the assessment include:

File review
Field inspections
Meeting with water system
Hydrogeology review and delineation

DHS and US EPA selected Yosemite National Park as a demonstration of the Drinking Water Source Assessment and Protection (DWSAP) program to complement ongoing environmental restoration work and infrastructure planning and to take advantage of the opportunity to educate large numbers of people on the importance of protecting drinking water resources. The Yosemite Valley water system was selected because it serves the most people in the park and there have been several hydrogeologic studies on the water resources in the area.

Discussion of Vulnerability

The activities to which the Yosemite Valley water supply is most vulnerable include historic gas stations and known contaminant plumes. A gas station with leaking underground storage tanks used to exist in the vicinity of the Yosemite Lodge. The gas station was removed and the tanks have been pulled out. There is ongoing remediation at the site. There have been no confirmed detections of contaminants in the wells.

Contents of this Assessment

Yes [X]	No [ ]	**Assessment Summary**
Yes [X]	No [ ]	**Vulnerability Summary**
Yes [ ]	No [X]	**Source Location Form**
Yes [X]	No [ ]	**Delineation of Ground Water Protection Zones**
Yes [X]	No [ ]	**Physical Barrier Effectiveness Checklist**
Yes [X]	No [ ]	**Well Data Sheet**
Yes [X]	No [ ]	**Inventory of Possible Contaminating Activities**
Yes [X]	No [ ]	**Vulnerability Ranking**
Yes [X]	No [ ]	**Assessment Map**

Comments

A more detailed report of the assessment was prepared by Leah Walker, CA Dept. of Health Services, Drinking Water Program, Source Assessment and Protection Coordinator.

Drinking Water Source Assessment and Protection (DWSAP) Program

Vulnerability Summary

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Completed by Leah Walker, Alexis Milea, Judy Bloom, **Date** July, 1998

THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT

A source water assessment was conducted for the **WELL 01**

of the **YOSEMITE NPS-YOSEMITE VALLEY** water system in **July, 1998** .

The source is considered most vulnerable to the following activities not associated with any detected contaminants:

Historic gas stations
Known Contaminant Plumes

A copy of the complete assessment may be viewed at:

DHS Drinking Water Field Operations Branch - Merced District Office
1040 E. Herndon Ave, Suite 205
Fresno, CA 93720-3158

You may request a summary of the assessment be sent to you by contacting:

District Engineer
559-447-3300

Drinking Water Source Assessment and Protection (DWSAP) Program

Delineation of Ground Water Protection Zones

District Name DHS Merced District **District No.** 11 **County** Mariposa

System Name YOSEMITE NPS-YOSEMITE VALLEY **System No.** 2210503

Source Name WELL 01 **Source No.** 001 **PS Code** 02S/22E-20M01 M

Completed by Leah Walker (DHS) and Hillary Hecht **Date** July, 1998

Method Used to Delineate Protection Zones

1. Calculated Fixed Radius
2. Modified Calculated Fixed Radius (Attach documentation for direction of ground water flow.)

X 3. More Detailed Methods

4. Arbitrary Fixed Radius (For use only by or permission of DHS)

Description of Protection Zones

Calculated Fixed Radius for Zone A and down-gradient boundary of Zones B5 and B10. Hydrogeologic mapping for Zones B5 and B10.

Two California approved delineation methods were used to define groundwater protection zones for the Yosemite Lodge Wellfield (DHS, 1998). The Calculated Fixed Radius (CFR) method was used to determine the direct protection zone and portions of the western boundaries of the inner and outer protection zones. The CFR method requires the use of the volumetric flow equation, which includes a value for effective porosity. A porosity value of 0.2 was used in all cases. The estimated value of 0.2 for effective porosity is reasonably conservative for most aquifers in California based on available information (DHS, 1998). The Hydrogeologic Mapping method was used to supplement the CFR determinations for the primary zones and to establish buffer zone boundaries. The availability of wellfield technical information and published geologic maps made this complementary use of the two methods possible. In addition, the pronounced geomorphology of the Yosemite Valley, including deep alluvial sediments in a bedrock trough and steep cliff faces, helped in conceptualizing a relationship between rock units and groundwater movement.

· Direct Protection Zone A (Microbial/Direct Chemical Contamination Zone)

Zone A was determined using the CFR method. A two-year time of travel radius was calculated. This radius was then centered on each of the wellheads in order to define circular areas. The delineation was completed by grouping the overlapping circular areas into one larger protection zone.

· Inner Protection Zone (Chemical Contamination Zone B5)

Zone B5 was determined using the CFR and Geologic Mapping methods. A 5-year time of travel radius was calculated and centered on well No. 4, the western most well. Only a segment of this boundary was used to define the zone. This segment was placed along a limited span of the western part of the valley floor between Columbia Rock and Sentinel Rock (Figure 9). Geologic mapping was then used to complete the remainder of the delineation for this zone. With the aid of geologic maps and technical reports, the northern and southern boundaries of the zone were placed to follow the contact between the cliff face and valley floor rock fall deposits. Northeast and southeast boundary segments were placed at approximately the mouths of Tenaya Canyon and Illouette Gorge at Sierra Point, respectively. An effort was made to align these two boundary segments with pronounced topographic features and to include potentially sensitive receptors like wetlands, springs and lakes in this zone.

· Outer Protection Zone (Chemical Contamination Zone B10)

Zone B10 was also determined by using the CFR and Geologic Mapping methods. A 10-year time of travel radius was calculated and centered on well No. 4. A segment of this boundary was then placed along a limited span of the western

Delineation of Ground Water Protection Zones

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part of the valley floor between Columbia Rock and Sentinel Point, similar to and just west of the Zone B5 boundary segment (Figure 9). Geologic mapping was then used to complete the delineation. In the northwest the boundary follows the geologic contact between the cliff face and valley floor rock fall deposits to a distance of approximately two miles up Tenaya Canyon. In the southwest the boundary follows the geologic contact between the cliff face and the valley floor through Illouette Gorge to Illouette Falls and then east along Panorama Cliff to Liberty Cap and around to Sierra Point. In both cases minor adjustments were made to include various waterfalls within the protection zone. This was because locations where streams debouch into the canyon and valley floors are possible focus points of recharge.

· Buffer Zones

Two buffer zones were delineated north and south of the Yosemite Lodge Wellfield. The areas included are outside and above the valley floor proximal to Indian Canyon and Sentinel Rock (Figure 9). These buffer zones roughly correspond to mapped occurrences of the Sentinel Granodiorite. There is evidence that the Sentinel Granodiorite is a particularly jointed rock unit. This means there is a potential for the flow of recharge through rock fractures to the valley deposits below. It is plausible in certain circumstances that this could result in the transport of contaminants to the wellfield. The buffer zone boundaries were defined entirely by geologic mapping. The emphasis was on including outcrops of the Sentinel Granodiorite. Slight accommodations were made to the buffer zone boundaries to include stream course locations, with the understanding that stream cuts can follow fracture traces.

Time	Q, gpm	Porosity	Screened Interval, feet	Radius, feet
2	850	0.20	60	1,780
5	850	0.20	60	2,815
10	850	0.20	60	3,980

Drinking Water Source Assessment and Protection (DWSAP) Program

Physical Barrier Effectiveness (PBE)

District Name DHS Merced District **District No.** 11 **County** Mariposa

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Completed by Leah Walker **Date** July, 1998

Parameter		Possible Points	This Source	Score
Type of Aquifer **Confinement**				
1. Unconfined, Semi-confined, Fractured Rock, Unknown Aquifer		0		
2. Confined		50	X	**50**
Pathways of Contamination (All Aquifers) **Presence of Abandoned or Improperly Destroyed Wells**				
1. Present within Zone A (2 year TOT distance)	Yes	0		
	No	5	X	**5**
	Unknown	0		
2. Present within Zone B5 (2 -5 year TOT distance)	Yes	0		
	No	3	X	**3**
	Unknown	0		
3. Present within Zone B10 (5-10 year TOT distance)	Yes	0		
	No	2	X	**2**
	Unknown	0		
Hydraulic Head (Confined Aquifers) **What is the relationship in the hydraulic head between the confined aquifer and the overlying unconfined aquifer? (i.e. does the well flow under artesian conditions?)**				
1. Head in confined aquifer is higher than head in unconfined aquifer under all conditions.		20		
2. Head in confined aquifer is higher than head in unconfined aquifer under static conditions.		10	X	**10**
3. Head in confined aquifer is lower than or same as head in unconfined aquifer under static conditions.		0		
4. Unknown		0		
Well Construction (All Aquifers)				
Sanitary Seal (Annular Seal) Depth **420** feet	None of less than 20 feet	0		
	Between 20 and 50 feet	6		
	50 feet or greater	10	X	**10**
	Unknown	0		
Surface Seal (concrete cap)	Not present or improperly constructed	0		
	Watertight, slopes away from well at least 2' laterally in all directions	4	X	**4**
	Unknown	0		

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Parameter		Possible Points	This Source	Score
Well Construction (All Aquifers)--continued				
Flooding potential at well site	Subject to localized flooding (i.e. in low area or unsealed pit or vault) or within 100 year flood plain	0	**X**	**0**
	Not subject to flooding	1		
	Unknown	0		
Security at well site	Not secure	0		
	Secure	5	**X**	**5**
	Unknown	0		

Score	Effectiveness
0 to 35	Low
36 to 69	Moderate
70 to 100	High

Maximum Score = 100

Score **89**

Effectiveness **High**

Drinking Water Source Assessment and Protection (DWSAP) Program

Inventory of Possible Contaminating Activities (PCA Inventory)

District Name DHS Merced District **District No.** 11 **County** Mariposa

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Source Name WELL 01 **Source No.** 001 **PS Code** 02S/22E-20M01 M

Completed by Leah Walker, Alexis Milea, Judy Bloom, **Date** May, 1998

PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Commercial/Industrial					
Automobile- Body shops (H)	N	N	N		
Automobile- Car washes (M)	N	**Y**	N		Wash rack near main bldg, all drains to sewer
Automobile- Gas stations (VH)	N	**Y**	N		1 gas sta. for employees @ maint. yard
Automobile- Repair shops (H)	N	**Y**	N		Yosemite Village, small engine repair
Boat services/repair/ refinishing (H)	N	N	N		
Chemical/petroleum pipelines (H)	N	**Y**	N		Boiler for Admin bldg, Valley District bldg
Chemical/petroleum processing/storage (VH)	N	**Y**	N		Temp. storage in sealed drums of waste oil, paint, contam. soil
Dry cleaners (VH)	N	N	N		
Electrical/electronic manufacturing (H)	N	N	N		
Fleet/truck/bus terminals (H)	N	**Y**	N		Yosemite Village buses
Furniture repair/ manufacturing (H)	N	**Y**	N		Cabinet shop- maint. yard, NPS maint. area
Home manufacturing (H)	N	N	N		
Junk/scrap/salvage yards (H)	N	N	N		Historic - outside zones
Machine shops (H)	N	**Y**	N		motor pool - village store, NPS maint. area (mostly gone)
Metal plating/ finishing/fabricating (VH)	N	N	N		
Photo processing/printing (H)	N	N	N		
Plastics/synthetics producers (VH)	N	N	N		
Research laboratories (H)	N	N	N		
Wood preserving/treating (H)	N	N	N		
Wood/pulp/paper processing and mills (H)	N	N	N		
Lumber processing and manufacturing (H)	N	N	N		
Sewer collection systems (H, if in Zone A, otherwise L)	**Y**	**Y**	**Y**		
Parking lots/malls (>50 spaces) (M)	**Y**	**Y**	N		
Cement/concrete plants (M)	**Y**	**Y**	N		small batch plants during construction

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Commercial/Industrial					
Food processing (M)	N	N	N		
Funeral services/graveyards (M)	N	**Y**	N		graveyard in NPS residential area
Hardware/lumber/parts stores (M)	N	**Y**	N		warehouse
Appliance/Electronic Repair (L)	N	**Y**	N		electronic repair @ maint. yard
Office buildings/complexes (L)	**Y**	**Y**	N		Yosemite Village
Rental Yards (L)	N	N	N		
RV/mini storage (L)	N	N	N		
Residential/Municipal					
Airports - Maintenance/ fueling areas (VH)	N	N	N		Helicopter landing area near Ahwahnee, no fuel
Landfills/dumps (VH)	N	N	N		
Railroad yards/ maintenance/ fueling areas (H)	N	N	N		
Septic systems - high density (>1/acre) (VH if in Zone A, otherwise M)	N	**Y**	N		vault toilet @ Chapel, no discharge since 1998, cesspool prior
Sewer collection systems (H, if in Zone A, otherwise L)	**Y**	**Y**	**Y**		
Utility stations - maintenance areas (H)	N	**Y**	N		warehouse, Yosemite Village machine shop
Wastewater treatment plants (VH in Zone A, otherwise H)	N	N	N		
Drinking water treatment plants (M)	**Y**	N	**Y**		chlorinators @ each well site, Vernal Falls water system
Golf courses (M)	N	**Y**	N		historic - Ahwahnee
Housing - high density (>1 house/0.5 acres) (M)	**Y**	**Y**	N		Yosemite Village, Curry Village, Yosemite Lodge
Motor pools (M)	N	**Y**	N		Village store, across from bus garage; govt end of Curry Village
Parks (M)	**Y**	**Y**	**Y**		
Waste transfer/recycling stations (M)	N	**Y**	N		Recycling center
Apartments and condominiums (L)	**Y**	**Y**	N		
Campgrounds/ Recreational areas (L)	**Y**	**Y**	N		Sunnyside camp in Zone A
Fire stations (L)	N	**Y**	N		@ village store, @ maint. yard (Fort Yosemite)

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Residential/Municipal					
RV Parks (L)	N	N	N		
Schools (L)	N	**Y**	N		elementary school
Hotels, Motels (L)	**Y**	**Y**	N		
Agricultural/Rural					
Grazing (> 5 large animals or equivalent per acre) (H in Zone A, otherwise M)	N	N	N		
Concentrated Animal Feeding Operations (CAFOs) as defined in federal regulation1 (VH in Zone A, otherwise H)	N	N	N		
Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H)	N	**Y**	N		80 horses just below Yosemite falls, 100 near N. Pines campgroun
Other Animal operations (H in Zone A, otherwise M)	N	**Y**	N		kennel
Farm chemical distributor/ application service (H)	N	N	N		
Farm machinery repair (H)	N	N	N		
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	N	N	N		historic (more than 30 years)
Lagoons / liquid wastes (H)	N	N	N		
Machine shops (H)	N	N	N		
Pesticide/fertilizer/ petroleum storage & transfer areas (H)	N	**Y**	N		pesticide storage (abate needle miner moth), Old Curry Dump
Agricultural Drainage (H in Zone A, otherwise M)	N	N	N		
Wells - Agricultural/ Irrigation (H)	N	N	N		
Managed Forests (M)	**Y**	**Y**	N		
Crops, irrigated (Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable) (M)	N	N	N		
Fertilizer, Pesticide/ Herbicide Application (M)	N	N	N		
Sewage sludge/biosolids application (M)	N	N	N		
Crops, nonirrigated (e.g., Christmas trees, grains, grass seeds, hay, pasture) (L) (includes drip-irrigated crops)	N	**Y**	N		unmaintained apple orchard near Curry Village

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Other					
NPDES/WDR permitted discharges (H)	**Y**	**Y**	N		storm water discharge permits
Underground Injection of Commercial/Industrial Discharges (VH)	N	N	N		
Historic gas stations (VH)	**Y**	**Y**	N		Zone A: Yosemite Lodge; Zone B5: Ice rink, Yosemite Village
Historic waste dumps/ landfills (VH)	N	**Y**	N		historic behind Curry Village and others
Illegal activities/ unauthorized dumping (H)	N	**Y**	N		Sunnyside camp
Injection wells/ dry wells/ sumps (VH)	N	N	N		
Known Contaminant Plumes (VH)	**Y**	**Y**	N		Zone A: Lodge towards river; Zone B5: maint. area
Military installations (VH)	N	N	N		historic - Army (cavalry), Navy housing
Mining operations - Historic (VH)	N	N	N		
Mining operations - Active (VH)	N	N	N		
Mining - Sand/Gravel (H)	N	**Y**	N		historic - sand from Mirror Lake (not since 1970's)
Wells - Oil, Gas, Geothermal (H)	N	N	N		
Salt Water Intrusion (H)	N	N	N		
Recreational area - surface water source (H)	**Y**	**Y**	**Y**		Merced River
Underground storage tanks - Confirmed leaking tanks (VH)	N	N	N		Have been pulled out
Underground storage tanks - Decommissioned - inactive tanks (L)	**Y**	**Y**	N		
Underground storage tanks - Non-regulated tanks (tanks smaller than regulatory limit) (H)	N	N	N		All are regulated
Underground storage tanks - Not yet upgraded or registered tanks (H)	N	N	N		
Underground storage tanks - Upgraded and/or registered - active tanks (L)	**Y**	**Y**	N		Diesel fuel tank for generator @ lift station; Lodge heating oil
Above ground storage tanks (M)	**Y**	**Y**	N		Zone A: Lodge propane tanks; Zone B5: diesel tank
Wells - Water supply (M)	**Y**	N	N		
Construction/demolition staging areas (M)	N	**Y**	N		Ongoing construction (future in Zone A)
Contractor or government agency equipment storage	N	**Y**	N		near maint. bldg staging area

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PCA (Risk Ranking)	PCA in Zone A	PCA in Zone B5	PCA in Zone B10	*	Comments
Other					
yards (M)					
Dredging (M)	N	N	N		
Transportation corridors - Freeways/state highways (M)	N	N	N		
Transportation corridors - Railroads (M)	N	N	N		
Transportation corridors - Historic railroad right-of-ways (M)	N	N	N		
Transportation corridors - Road Right-of-ways (herbicide use areas) (M)	N	N	N		
Transportation corridors - Roads/ Streets (L)	**Y**	**Y**	N		
Hospitals (M)	N	N	N		
Storm Drain Discharge Points (M)	**Y**	**Y**	N		Zone A: Lodge (by school, goes to meadow); Zone B5: ballfield
Storm Water Detention Facilities (M)	N	N	N		
Artificial Recharge Projects - Injection wells (potable water) (L)	N	N	N		
Artificial Recharge Projects - Injection wells (non-potable water) (M)	N	N	N		
Artificial Recharge Projects - Spreading Basins (potable water) (L)	N	N	N		
Artificial Recharge Projects - Spreading Basins (non-potable water) (M)	N	N	N		
Medical/dental offices/clinics (L)	N	**Y**	N		
Veterinary offices/clinics (L)	N	N	N		
Surface water - streams/ lakes/rivers (L)	**Y**	**Y**	**Y**		
Wells - monitoring, test holes (L)	**Y**	**Y**	N		Zone A: Lodge; Zone B5: maint. area

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Drinking Water Source Assessment and Protection (DWSAP) Program

Vulnerability Ranking

District Name DHS Merced District **District No.** 11 **County** Mariposa

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Completed by Leah Walker **Date** July, 1998

Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
A	Historic gas stations (VH)		7	5	1	13
A	Known Contaminant Plumes (VH)		7	5	1	13
A	NPDES/WDR permitted discharges (H)		5	5	1	11
A	Recreational area - surface water source (H)		5	5	1	11
A	Sewer collection systems (H, if in Zone A, otherwise L)		5	5	1	11
A	Sewer collection systems (H, if in Zone A, otherwise L)		5	5	1	11
B5	Automobile- Gas stations (VH)		7	3	1	11
B5	Chemical/petroleum processing/storage (VH)		7	3	1	11
B5	Historic gas stations (VH)		7	3	1	11
B5	Historic waste dumps/ landfills (VH)		7	3	1	11
B5	Known Contaminant Plumes (VH)		7	3	1	11
A	Above ground storage tanks (M)		3	5	1	9
A	Cement/concrete plants (M)		3	5	1	9
A	Drinking water treatment plants (M)		3	5	1	9
A	Housing - high density (>1 house/0.5 acres) (M)		3	5	1	9
A	Managed Forests (M)		3	5	1	9
A	Parking lots/malls (>50 spaces) (M)		3	5	1	9
A	Parks (M)		3	5	1	9
A	Storm Drain Discharge Points (M)		3	5	1	9
A	Wells - Water supply (M)		3	5	1	9
B5	Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H)		5	3	1	9
B5	Automobile- Repair shops (H)		5	3	1	9
B5	Chemical/petroleum pipelines (H)		5	3	1	9
B5	Fleet/truck/bus terminals (H)		5	3	1	9
B5	Furniture repair/ manufacturing (H)		5	3	1	9
B5	Illegal activities/ unauthorized dumping (H)		5	3	1	9
B5	Machine shops (H)		5	3	1	9
B5	Mining - Sand/Gravel (H)		5	3	1	9

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System Name YOSEMITE NPS-YOSEMITE VALLEY **System No.** 2210503

Source Name WELL 01 **Source No.** 001 **PS Code** 02S/22E-20M01 M

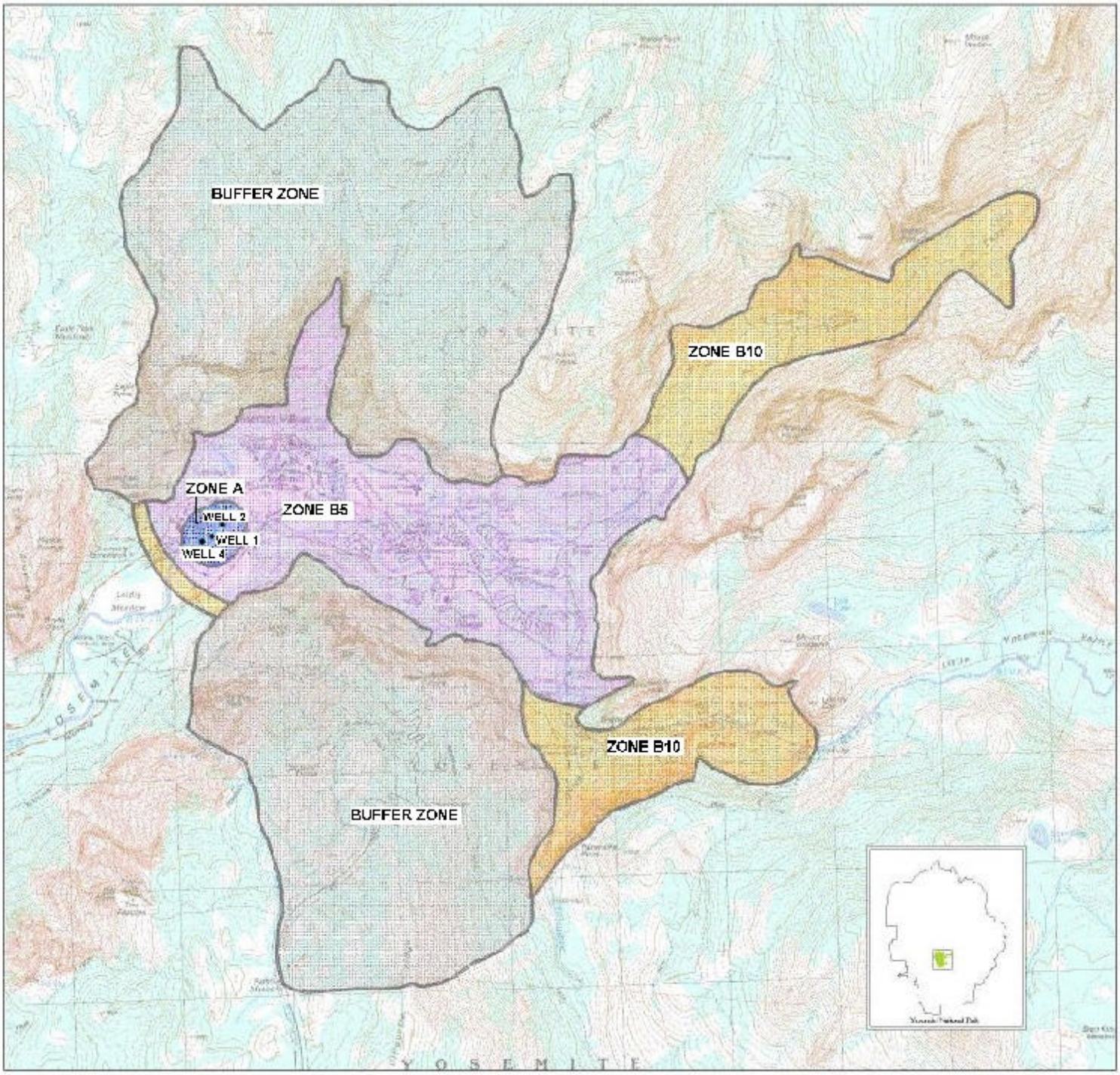
Zone	PCA (Risk Ranking)	*	PCA Risk Points	Zone Points	PBE Points	Vulnerability Score
B5	NPDES/WDR permitted discharges (H)		5	3	1	9
B5	Pesticide/fertilizer/ petroleum storage & transfer areas (H)		5	3	1	9
B5	Recreational area - surface water source (H)		5	3	1	9
B5	Utility stations - maintenance areas (H)		5	3	1	9

*** = A contaminant potentially associated with this activity has been detected in the water supply.**

Drinking Water Source Assessment and Protection Program

Control Zone Delineation

Yosemite National Park



- Drinking Water Wells
- Zone A – Direct Protection Zone
- Zone B5 – Inner Protection Zone
- Zone B10 – Outer Protection Zone
- Buffer Zones

.25 0 .25 .5 .75 1

Miles

Polygon boundaries are approximate

Sources of Information
1) Drinking Water Source Assessment and Protection Program – California Department of Health Services.
2) Mather, F.E., 1930 Geologic History of the Yosemite Valley, USGS Prof Paper 160.
3) Hitton, M.S., 1983, The Geologic Story of Yosemite National Park, USGS Bulletin 1595.
4) USGS 7.5 minute orthophotographic quadrangles.

EPA